EXECUTIVE SUMMARY

This first volume of the ASP is designed to provide a potential user with a characterization of the current status of the subject model or simulation with respect to criteria related to its general acceptability for use. The information presented in this volume should characterize the software well enough to provide an initial determination of its suitability for a particular application. It should also provide confidence that the model is well enough managed and supported to yield consistent results across its spectrum of users and applications. The information provided to characterize the subject model consists of the following elements.

a. A description of the configuration management baseline for the model, including version history, current version status, model development policy (including beta site provisions), documentation availability, and a summary of configuration management policies, procedures, guidelines and support functions in place for the model;

b. A summary of implicit and explicit assumptions and limitations inherent in the model because of its design and/or coding assumptions or structure, as well as any implied constraints to the use of the model that are a consequence of these assumptions or structures. A listing of known errors or anomalies found as a result of prior verification and validation (V&V) efforts is also included;

c. A review of the model's development, V&V and usage histories, as well as a summary of prior accreditations;

d. A review of the status of model documentation and its conformity to accepted software documentation standards, as well a review of documentation with respect to verification requirements, and;

e. A summary of overall software quality as characterized by conformance to language standards and accepted software engineering (design and coding) practices.

ASP-I provides the details of these information elements in a single document. The degree to which each information element is complete and current provides a general indication of whether the model is suitable for further consideration for use in a particular application.

Configuration Management Baseline: This edition of ASP-I describes BLUEMAX III version 2.0, which is the current baseline that was released in April 1997. Information is provided in Section 2 that describes this version and differences with respect to prior ones. A brief development history is also provided along with data on CM procedures in place and user support functions available.

BLUEMAX III is a flight path data generator that simulates aircraft movement in response to user inputs. It uses aircraft-specific tables that define weight, thrust, lift, drag, and fuel consumption properties for various configurations, which may include external stores and weapons. The simulation can be run in either of two modes: interactive and automatic. Outputs consist of position, velocity, acceleration, and orientation values at a user-defined

time step. These files are typically used to provide inputs to engagement simulations for the evaluation of maneuver effects on threat system capabilities, but may also be used to evaluate performance differences among aircraft types or various configurations of a type.

BLUEMAX III is managed and maintained by the USAF Aeronautical Systems Command (ASC) and the Joint Technical Coordinating Group for Aircraft Survivability (JTCG/AS). It is distributed and supported by Booz-Allen, Hamilton, Inc. via a contract with the Survivability/Vulnerability Information Analysis Center (SURVIAC) located as Wright-Patterson Air Force Base (WPAFB), OH. Distribution of BLUEMAX III is controlled by SURVIAC for the JTCG/AS and aircraft-specific data files are provided by the ASC model manager. In addition to the software, the distribution includes a User, Analyst, and Programmer Manual documentation set, and sample data sets for testing.

Assumptions, Limitations, and Errors: Tables of these for BLUEMAX III Version 2.0 are presented in Section 3. The assumptions and limitations associated with BLUEMAX III reflect the intended uses of the simulation. Error corrections and model enhancements are made periodically in accordance with the CM plan.

V&V Status and Usage History: Very little verification or validation documentation is available for BLUEMAX III, but two users in addition to the model manager reported that either direct code inspections (verification) or comparisons with test data (validation) had been performed. The software has been used in numerous studies to support evaluation and acquisition of weapon systems. These have included the AMRAAM and JSOW in addition to A-10A, B-1B, B-2, and JSF aircraft programs.

Since its initial development in 1975, BLUEMAX III has been obtained and used by many different organizations. This wide-spread use is strong evidence of community acceptance. The BLUEMAX user community spans the systems acquisition and operational domains and includes service agencies and DoD contractors.

Documentation Assessment: The documentation provided with BLUEMAX III is quite complete and includes almost all of the information desired in the three manual set. A software design document does not exist, but verification of the design is not anticipated in the near future. Some recommendations for additions and improvements are listed in the assessment provided in Section 5.

Software Quality Assessment: BLUEMAX III is written in FORTRAN 77 and complies with the ANSI standard specification. Twenty-eight percent of the soruce code was examined and only a few minor deficiencies were noted. The overall compliance score of 86% was just above the middle of the fully compliant range (70%-100%). The methods used and results of the SQA are provided in Section 6.